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Date: _02/27/04_   Express Mail Label No. _EV 214 952979 US_

Inventors: Neil J. Goldfine, Vladimir A. Zilberstein, Darrell E. Schlicker, David C.
Grundy, Ian C. Shay and Andrew P. Washabaugh

Attorney's Docket No.: 1884.2005-003

HIGH RESOLUTION INDUCTIVE SENSOR ARRAYS FOR MATERIAL AND DEFECT CHARACTERIZATION OF WELDS

RELATED APPLICATIONS

now patent No. US6727691

5   This application is a divisional of U.S. Application No. 10/046,925, filed
January 15, 2002, which is a continuation-in-part of U.S. Application No. 09/891,091,
filed June 25, 2001, which claims the benefit of U.S. Provisional Application No.
60/214,177, filed June 26, 2000, U.S. Provisional Application No. 60/248,104, filed
November 13, 2000, U.S. Provisional Application No. 60/276,997, filed March 19,
10   2001, U.S. Provisional Application No. 60/277,532, filed March 21, 2001, U.S.
Provisional Application No. 60/284,972, filed April 19, 2001, and U.S. Provisional
Application No. 60/297,926, filed June 13, 2001. The entire teachings of the above
applications are incorporated herein by reference.

BACKGROUND

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The technical field of this invention is that of nondestructive materials
characterization, particularly as it applies to postweld and in-process weld scanning for
quality control, in-process monitoring, and seam tracking using spatially periodic field
eddy current sensors.

20   There is an increasing need for a nondestructive method for assessing the quality
of welds between materials, including the detection and characterization of defects. In
particular, friction stir welding is becoming more commonly used as a joining technique
for a variety of metals, including aluminum, titanium and nickel base alloys as well as